

performance measure of a semiconductor wafer processing system because it is related to productivity: the higher the throughput, the more wafers that can be processed within a given amount of time. Accordingly, the cost of ownership of a semiconductor wafer processing system and the fabrication cost per wafer depend on throughput.

5 SUMMARY

The present invention relates to a method, system, and associated apparatus for high throughput semiconductor processing applications. The invention may be used in a wide variety of semiconductor processing applications including physical vapor deposition (PVD), chemical vapor deposition (CVD), etching, etc.

A semiconductor wafer processing system in accordance with an embodiment of the present invention includes a loading station, a load lock, a process module, an intermediate process module, and a transport module which further includes a load chamber, a transfer chamber, and a pass-through chamber between the load chamber and the transfer chamber. The intermediate process module is coupled to the load chamber; in one embodiment, the intermediate process module is also coupled to the transfer chamber.

In one embodiment, the load lock is a single-wafer load lock capable of accommodating only a single wafer at a time, and correspondingly has a small volume which results in fast pump down and vent cycles.

20 In one embodiment, the load lock is capable of cooling a wafer during a vent cycle. This eliminates the need to cool the wafer in a separate cooling station prior to returning the wafer to its cassette on the loading station.